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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/836,284	04/18/2001	Kazunaga Suzuki	Q64167	5459

7590 10/08/2002

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WASHINGTON, DC 20037-3213

EXAMINER

TRAN, LY T

ART UNIT	PAPER NUMBER
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2853

DATE MAILED: 10/08/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/836,284

Applicant(s)

SUZUKI, KAZUNAGA

Examiner

Ly T TRAN

Art Unit

2853

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1,6-11 and 13-16 is/are rejected.
- 7) ☒ Claim(s) 2-5,12 and 17 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1 and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Ebisawa (USPN 5,428,380).

With respect to claim 1, Ebisawa discloses an ink jet recording apparatus comprising a recording head including a nozzle orifice communicated with a pressure generating chamber, a pressure generator, which varies pressure of ink the pressure generating chamber (Column 14: line 12-33) and a controller, which drives the pressure generator to eject ink droplets from the nozzle orifice such that a plurality of flushing operations are intermittently repeated with a first time interval when a recording operation of the recording head is not performed, each flushing operation including a plurality of ink ejections repeated for a predetermined times with a second time interval which is shorter than the first time interval or in another word, the flushing period is longer than the ink ejecting period (Column 8: line 16-22: discloses the amount of discharge ink with the compulsory recovery is $64 \times 80 \text{ pl} \times 10^6$ pulse, so if there are 64

discharge ports then the time of one discharge port discharges the ink is has to be shorter than the time of all 64 discharge ports discharge the ink).

With respect to claim 10, Ebisawa discloses the recording head performs the recording operation while moving a main scanning direction (Fig.1) and the flushing operations are performed when the recording head is in a stand-by-state which is defined as a time period from when the recording head stops moving when the recording head stops moving to when the recording head is stars moving (Column 4: line 31-32)

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 6, 7 and 14, 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ebisawa (USPN 5,428,380) in view of Kitahara (USPN 6,357,846)

Ebisawa fails to teach the controller driver the pressure generator to vibrate a meniscus of ink in the nozzle orifice between the respective flushing operations, the meniscus of ink is vibrated such an extent that an ink droplet is not ejected from the nozzle orifice, pressure generator is a piezoelectric and a vibrating number of pressure generator is determined in accordance with the type of ejected ink.

Kitahara teaches the controller driver the pressure generator to vibrate a meniscus of ink in the nozzle orifice between the respective flushing operations, the meniscus of ink is vibrated such an extent that an ink droplet is not ejected from the nozzle orifice (Column 3: line 27-32), and Kitahara also teaches the pressure generating element can be a piezoelectric element or a heating element (Column 3: line 1-6) and a vibrating number of pressure generator is determined in accordance with the type of ejected ink (Column 6: line 14-33)

It would have been obvious to one having ordinary skill in the art at the time the invention was made with vibrate a meniscus of ink in the nozzle orifice between the respective flushing operations, the meniscus of ink is vibrated such an extent that an ink droplet is not ejected from the nozzle orifice as taught by Kitahara. The motivation of doing so is necessary fine vibration is applied to the meniscus of ink in each nozzle when the fine vibration is needed, in according with the operation conditions of each nozzle.

3. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ebisawa (USPN 5,428,380) in view of Kobayashi et al. (USPN 6,036,299).

Ebisawa fails to teach the controller drives the pressure generator to vibrate a meniscus of ink in the nozzle orifice before an initial flushing operation of performed.

Kobayashi et al teaches the controller drives the pressure generator to vibrate a meniscus of ink in the nozzle orifice before an initial flushing operation of performed (Fig.2: element 24, Column 4: line 10-12).

It would have been obvious to one having ordinary skill in the art at the time the invention was made with the controller drives the pressure generator to vibrate a meniscus of ink in the nozzle orifice before an initial flushing operation of performed as taught by Kobayashi et al. The motivation of doing so is in order to cause the air bubble to be reduced to very small bubble or disappear (Kobayashi USPN 6,036,299, Column 11: line 19-21)

4. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ebisawa (USPN 5,428,380) in view of Takahashi et al. (USPN 5,475,404).

Ebisawa fails to teach a timer which measures a time period of the stand-by state, wherein repeated number of ink ejections in the respective flushing operation is determined in accordance with the measured stand-by state.

Takahashi teaches a timer which measures a time period of the stand-by state, wherein repeated number of ink ejections in the respective flushing operation is determined in accordance with the measured stand-by state (Fig.6: element 502-510, Column 8: line 55-65).

It would have been obvious to one having ordinary skill in the art at the time the invention was made with a timer which measures a time period of the stand-by state, wherein repeated number of ink ejections in the respective flushing operation is determined in accordance with the measured stand-by state as taught by Takahashi et al. The motivation of doing so is in order to optimizing a recover operation (Takahashi USPN 5,475,404, Column 4: line 41-42).

5. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ebisawa (USPN 5,428,380) in view of Kitahara (USPN 6,357,846).

Ebisawa fails to teach a vibrating number of pressure generator is determined in accordance with the type of ejected ink.

Kitahara teaches a vibrating number of pressure generator is determined in accordance with the type of ejected ink (Column 6: line 14-33)

It would have been obvious to one having ordinary skill in the art at the time the invention was made with a vibrating number of pressure generator is determined in accordance with the type of ejected ink as taught by Kitahara. The motivation of doing so is in order to preventing the viscosity increase and stabilizing the flying path of the ink drop.

6. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ebisawa (USPN 5,428,380) in view of Kobayashi et al. (USPN 6,036,299) as applied to claim 1 and 9 above, further in view of Kitahara (USPN 6,357,846).

The combination of Ebisawa and Kobayashi et al fails to teach a vibrating number of pressure generator is determined in accordance with the type of ejected ink.

Kitahara teaches a vibrating number of pressure generator is determined in accordance with the type of ejected ink (Column 6: line 14-33)

It would have been obvious to one having ordinary skill in the art at the time combined invention of Ebisawa and Kobayashi was made with a vibrating number of

pressure generator is determined in accordance with the type of ejected ink as taught by Kitahara. The motivation of doing so is in order to preventing the viscosity increase and stabilizing the flying path of the ink drop.

7. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ebisawa (USPN 5,428,380) in view of Kitahara (USPN 6,357,846).

The combination of Ebisawa and Kitahara discloses the claimed invention except for the pressure generator is driven at the maximum driving frequency to vibrate the meniscus of ink. It would have been obvious to one having ordinary skill in the art at the time the invention was made to vibrate the ink at the maximum driving frequency, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art.

Allowable Subject Matter

8. Claims 2-5, 12 and 17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 2 and 3 appear to be allowable over the prior art of record because at least prior art record have not been found or teach an ejection frequency in a final flushing operation is higher than an ejection frequency in an initial operation.

Claims 4 and 5 appear to be allowable over the prior art of record because at least prior art record have not been found or teach the repeated number of ink ejection in a final flushing operation is greater than the repeated number of ink ejection in an initial flushing operation.

Claim 12 appears to be allowable over the prior art of record because at least prior art record have not been found or teach a vibrating number is determined in accordance with the measured length of the stand-by time period.

Claim 17 appears to be allowable over the prior art of record because at least prior art record have not been found or teach the combination of a drive signal generator, which generated a common drive signal including a flushing waveform configured to perform an ink ejection and a meniscus vibrating waveform configured to vibrate a meniscus of ink in the nozzle orifice.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ly T TRAN whose telephone number is 703-308-0752. The examiner can normally be reached on M-F (7:30am-5pm).

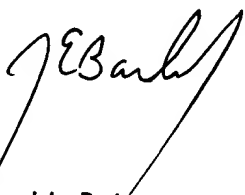
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Barlow can be reached on 703-308-3126. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7724 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0967.

October 3, 2002



John Barlow
Supervisory Patent Examiner
Technology Center 2800